Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use of the 3.7 to 4.2 GHz Band	)	GN Docket No. 18-122
	)	
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band	)	RM-11791
	)	
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service	)	RM-11778

COMMENTS OF BYU BROADCASTING

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BYU Broadcasting, a division of Brigham Young University, a Utah non-profit educational institution ("BYUB"), files these comments to the Commission's Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding, which seeks additional comments on the future of the 3.7-4.2 GHz spectrum band ("C-band").[1]

Established in 1946, BYU Broadcasting operates radio and television networks that provide family-friendly and educational content, including comedy variety shows like "Studio C," live sports, dramas, and documentary programming. The mission of BYUtv, BYU Broadcasting's flagship network, is to provide engaging and purposeful programming that uplifts and inspires families and communities. BYUtv is broadcast via over-the-air, cable, and satellite

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[1] *In re Expanding Flexible Use of the 3.7 to 4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd. 6915 (2018) (hereinafter "NPRM"); *International Bureau And Wireless Telecommunications Bureau Seek Focused Additional Comment In 3.7-4.2 Ghz Band Proceeding*, Public Notice, DA 19-385 (rel. May 3, 2019) (hereinafter "Notice").

systems to over 54 million homes throughout the United States and millions more throughout world.

As a non-profit broadcaster based at a university, BYUB is uniquely positioned to serve the media needs of families across the country. Because of its particular circumstances, BYUB relies on public interest carriage agreements and forming partnerships with cable and satellite partners. As such, maintaining a robust video distribution system with ample bandwidth for all media operations is of the utmost importance for BYUB to continue to provide educational and family-focused content to its viewers.

I. INTRODUCTION AND SUMMARY

The record demonstrates that the C-band offers unparalleled reliability and capability for terrestrial mobile, fixed operations, and manufacturing.[2] BYUB supports the Commission's efforts to examine the best manner to encourage and facilitate 5G deployment throughout the United States. While some commenters during the proceeding have called for "rapid action" to maintain pace with 5G development in other countries,[3] BYUB cautions against a hasty approach that fails to properly account for the vital importance of the C-band to video distribution systems throughout the country and thanks the Commission for seeking additional comments on this important issue. The goal of achieving 5G capabilities should be realized through thoughtful consideration of the public interest and the unique value FSS and FS operations offer to millions of Americans in the form of video backhaul and distribution.

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[2] *See, e.g.*, Reply Comments of AT&T Services, Inc., GN Docket No. 18-122 (filed Dec. 11, 2018) ("AT&T Reply Comments"); Letter from Christopher D. Imlay, Booth, Freret & Imlay, LLC, Counsel to Robert Bosch LLC, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed June 10, 2019).

[3] Reply Comments of Verizon, GN Docket No. 18-122, at 3 (filed Dec. 11, 2018).

As an operator of both receive-only and uplink C-band earth stations in Utah and Idaho, the C-band spectrum is integral to BYUB's services and media delivery operations.[4] The reach, reliability and economic efficiency of these satellite services are unparalleled, and there are no alternate means of distribution that are feasible in the foreseeable future. In addition, BYUB utilizes transportable C-band uplinks in conjunction with its sports broadcasts across the country.

It has been suggested by some filings that programmers and broadcasters can quickly move content distribution to fiber or alternate satellite frequencies (Ka- and Ku-band).[5] Unfortunately, this is not viable. BYUB services many rural communities that cannot be easily reached by fiber because it is not available. In fact, BYUB has a substantial number of small subscribers that are currently taking BYUB programming via the C-band and could not get our signal in any other way. Alternatively, the Ka- and Ku-bands are unreliable due to their propagation characteristics.

BYUB's evaluation of the suggested alternative technologies mentioned above demonstrates that there is a large gap in availability, coverage, reliability, and economics. Being forced out of the C-band would dramatically increase BYUB's cost structure, reduce its ability to serve customer communities, and negatively impact its overall operations. While comments submitted throughout this proceeding demonstrate the value of the C-band for mobile terrestrial use as well as its necessity to continued media and content delivery, no plan, as noted by the Content Companies, put forth by any interested party has adequately addressed the exact method

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[4] These earth stations are located in populous areas that would certainly be impacted spectrum reallocations in urban areas.

[5] *See, e.g.,* Comments of Verizon, GN Docket No. 18-122, at 12-13 (filed Oct. 29, 2018) ("Verizon Comments"); Reply Comments of Google, GN Docket No. 18-122, at 16 (filed Dec. 11, 2019).

and conditions that will ensure uninterrupted and continuous distribution of video programming.[6] The C-band is critical for the services provided by BYU Broadcasting in its delivery of family-friendly content to millions of Americans and as such BYUB requires a plan that addresses the need for these services.[7]

The C-Band Alliance ("CBA") has designed a comprehensive plan that orchestrates constructing and launching satellites, migrating customer transmission services into the upper 300 MHz of the spectrum, upgrading all the C-band receive sites and providing funding insight and completion guarantees. Under the CBA plan, services will be migrated and protected in the upper 300 MHz of the spectrum, allowing 5G and our media distribution services to operate in an interference free environment. While BYUB does have concerns about the financial benefits which might inure to the CBA under their plan and is not currently willing to endorse that portion of the proposed plan, no other plan has been introduced that provides the resources required to adapt procedures to maintain BYUB's operations.

Regardless of the C-band reallocation mechanism utilized—whether market-based or FCC administered—incumbent video distribution operations must be protected. The plans presented during the current proceeding have failed to supply the specific methods that will be employed to protect reliable video distribution. Earth stations, both uplink and receive-only, merit protections under Commission rules and statute. Moreover, if the Commission determines that any earth station relocation is necessary, earth station operators should be compensated for

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[6] Reply Comments of Content Companies, GN Docket No. 18-122, at 1 (filed Dec. 11, 2018) ("Content Companies Reply Comments").

[7] *See also* Letter from Tony Cardenas & Adam Kinzinger, Congressmen, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 1 (filed Feb. 22, 2019) ("In fact, nearly every television viewer and radio listener depends on C-band spectrum to reliably receive content.").

any expenses incurred as part of relocating. Furthermore, any reallocation must continue to allow ample C-band spectrum availability for the transportable C-band uplinks necessary for news gathering and live sports distribution.[8] Due to the radical disruption this reallocation could engender, BYUB urges the Commission to seek further comment on the technical and logistical requirements for earth station protections as well as the appropriate amount of spectrum reallocation that will allow incumbent operations in the band to continue uninterrupted while maximizing the spectrum for mobile use.[9]

II. EARTH STATIONS ARE ENTITLED TO INTERFERENCE PROTECTIONS AND REMUNERATION FOR GIVING UP THEIR LICENSED SPECTRUM USAGE RIGHTS.

The Commission seeks further comment concerning whether Section 316 of the Communications Act imposes any requirements or obligations on the Commission in regards to registered receive-only earth stations and whether receive-only earth stations have licensed spectrum usage rights, which they can voluntarily relinquish for a share of spectrum sale proceeds.[10] The language of both the Communications Act and FCC regulations demonstrate that FS operators are entitled to interference protections and spectrum usage rights as well as

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[8] *See* Letter from Henry G. Hultquist, Vice-President, Federal Regulatory, AT&T, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 14 (filed June 6, 2019) ("AT&T Letter") ("Note, however, that the possibility of locating non-broadcast, non-cable uses at the high end of the band should be balanced against other important uses, such as programmers' use of the same spectrum for production of high-value sporting and political events using mobile C-band satellite trucks.").

[9] While some in the Commission are arguing for over 300 MHz to be reallocated, see Statement of Comm'r O'Rielly to the Senate Commerce Committee, June 12, 2019 (available at https://docs.fcc.gov/public/attachments/DOC-357955A1.pdf), BYB strongly urges the Commission to examine current and future incumbent needs before dictating what amount of spectrum should be reallocated, rather than responding impulsively due to the claimed promises of 5G.

[10] Notice, at 5.

protection from radical modifications of their licenses. As such, the Commission may ask them to relinquish their rights voluntarily and share with them proceeds from the sale of spectrum, or, alternatively, require any private auctions or reallocation mechanisms to cover any costs incurred to earth station operators by the reallocation process.

A. Earth Stations are licensees entitled to spectrum protections under the Communications Act and Commission rules.

The Commission asks the meaning of "licensee" and "licensed spectrum usage rights" in section 309(j).[11] While "licensed spectrum usage rights" are not defined in the Communications Act, reading the term with other provisions of the Act and Commission rules strongly reinforces that earth stations—both receive-only and uplinks—are licensees under the Act and entitled to protections for authorized frequencies, i.e., they have "licensed spectrum usage rights." A "licensee" is the holder of a station license, which is defined as "that instrument of authorization required by this chapter or the rules and regulations . . . for the use or operation of apparatus for transmission of energy . . . by whatever name the instrument may be designated by the Commission."[12] As such, earth stations should be compensated for voluntarily relocating and vacating parts of the C-band.

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[11] *Id.* at 4.

[12] 47 U.S.C. § 153(30); § 153(49). Earth stations, whether receive-only or transceivers, are necessary to the transmissions of radio signals for communication. As defined in the Act, the "transmission of energy by radio" term used to describe station licenses includes "instrumentalities, facilities, and services *incidental* to such transmission." 47 U.S.C. § 153(57) (emphasis added); *see also* 47 U.S.C. § 153(49) (stating that station licenses are "that instrument of authorization required by this chapter or the rules and regulations . . . for the use or operation of apparatus for transmission of energy, or communications, or signals by radio…"). While receive-only earth stations do not emit energy, they are still considered to be part of the transmission of radio signals by the D.C. Circuit. Nat'l Ass'n of Broadcasters v. F.C.C., 740 F.2d 1190, 1204 (D.C. Cir. 1984); *see* 47 U.S.C. § 153(40).

Regardless of the designation, because a license is any "instrument of authorization," earth stations operate as licensees when they register and are given interference protections for "authorized frequency bands" by the Commission.[13] Throughout the Commission's rules, receive-only earth stations are even stated to have "authorizations" when they are registered.[14] Additionally, the Commission itself has stated that while a formal license is not issued under the registration program, the "registration program will afford the same protection from interference as would a license issued under [the Commission's] former procedure."[15] Although registration of receive-only earth stations is voluntary,[16] the registration entitles the earth station to interference protections and gives it rights over other unregistered stations.[17] The authorization of the Commission in the form of registration gives the registered station priority access and protections to the spectrum in a geographic area.[18] Furthermore, the same forms are utilized for both earth station registration and earth station licensing.[19] Thus, receive-only earth stations who wish to receive interference protections must utilize a process similar to the licensing of transmitting earth stations.

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13 47 U.S.C. § 153(49); 47 C.F.R. § 25.131.

14 *See* 47 C.F.R. § 25.203(b)-(c); 47 C.F.R. § 25.137(a).

15 *In the Matter of Amendment of Part 25 of the Commission's Rules & Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings & to Revise Application Processing Procedures for Satellite Commc'ns Servs.*, 6 F.C.C. Rcd. 2806, 2807, para. 7 (1991).

16 *See* 47 C.F.R. § 25.131(b) ("Receive-only earth stations . . . may be registered with the Commission in order to protect them from interference….")

17 *But see* Letter from Henry Gola, Counsel to the C-band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 1-3 (filed Mar. 7, 2019) (arguing that earth stations are not licensees).

18 If an earth station were to fail to register, it would risk having to shut down or relocate upon the registration of a nearby earth station. Arguably, station licenses are only those authorizations that are "required by" the Communications Act to use and operate radio equipment. *See* 47 U.S.C. § 153(49). However, these authorizations are required in order to receive the protections necessary to "use" radio equipment in many areas where coordination and interference protections are merited.

19 47 C.F.R. § 25.131(d).

The Communications Act allows the Commission to compensate licensees for voluntarily vacating spectrum as part of an incentive auction.[20] Allowing voluntary exit from the spectrum and fair compensation for such exit allows for the market to determine the best use of the spectrum and avoid the Commission having to choose winners and losers.[21] As licensees, or the equivalent of such, the Commission can and should compensate earth station operators for vacating part of the C-band. Similarly, if the Commission elects to utilize the CBA's market-based approach, it can require the CBA to compensate and cover all costs of retrofitting earth stations as the CBA has offered to do in its plan.

Upon registration, receive-only earth stations are licensees under the Communications Act and have rights to interference protections and priority to the spectrum they have registered in their geographic location. Although they are designated as "registrants," the rights and protections are such that they become co-equal with licensees and they should be treated as such.

B. While section 316 may allow the Commission to modify licenses, it may do so only so far as it does not essentially change the terms of the license.

The reallocation of the C-band may necessitate the modification of FSS and earth stations operators' authorizations and licenses in order to accommodate additional terrestrial mobile operations in the band. While the Commission has broad authority to modify the terms of

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[20] 47 U.S.C. § 309(j)(8). While the C-band spectrum is not owned by incumbents, see Mobile Relay Assocs. v. F.C.C., 457 F.3d 1, 12 (D.C. Cir. 2006), compensating them for leaving the C-band allows the Commission to recognize their authorization to use the band and the public service they have rendered. Most importantly, compensation will assist earth station operators in making the required adjustments to continue video distribution services to hundreds of millions of Americans.

[21] *See* 158 CONG. REC. E237-04, E238 (daily ed. Feb. 17, 2012) (statement of Rep. Upton); 158 CONG. REC. H907-03, H914 (daily ed. Feb. 17, 2012) (statement of Rep. Walden).

licenses in order to serve the public interest, it cannot do so in a way that fundamentally changes the terms of that license without notification and a hearing.[22]

While section 316 may not impose specific obligations upon the Commission, the D.C. Circuit recognized that although the FCC has broad authority to modify station licenses, the Commission cannot modify licenses in a manner that "fundamentally changes those licenses."[23] Any reallocation of spectrum that substantially inhibits incumbent operations would be a fundamental change and is not a "modification" allowed under Title III of the Act because the power to modify station licenses for the public interest does not "confer an unlimited power."[24] A radical change in rules and limitations placed on FSS operators that imposes large restrictions or vastly limits the ability of incumbent FSS operations would exceed the bounds of a modification.[25] As such, any license modification enacted by the Commission pursuant to its section 316 would need to be limited in scope so as to not unduly restrict FSS operations, or would require the consent of FSS operators.

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[22] 47 U.S.C. § 316(a)(1); *see* Cellco Partnership v. F.C.C., 700 F.3d 534, 543 (D.C. Cir. 2012) ("[Plaintiff] is right that the Commission's section 316 power to "modif[y]" existing licenses does not enable it to fundamentally change those licenses.") (citations omitted); California Metro Mobile Commc'ns, Inc. v. F.C.C., 365 F.3d 38, 45 (D.C. Cir. 2004) ("Section 316 grants the Commission broad power to modify licenses; the Commission need only find that the proposed modification serves the public interest, convenience and necessity."); Community Television, Inc. v. FCC, 216 F.3d 1133, 1140–41 (2000) ("Section 316 provides that no order of modification shall become final until the licensee shall have been notified of the proposed action and given an opportunity for hearing."); *In the Matter of Improving Pub. Safety Commc'ns in the 800 Mhz Band Consolidating the 800 & 900 Mhz Industrial1land Transportation & Bus. Pool Channels*, 20 F.C.C. Rcd. 16015, 16044 (2005) ("[T]he Commission has broad discretion in modifying licenses when doing so would serve the public interest.").

[23] *Cellco*, 700 F.3d at 543; Peoples Broad. Co. v. United States, 209 F.2d 286, 288 (D.C. Cir. 1953); *see also* MCI Telecomm. Corp. v. Am. Tel. & Tel. Co., 512 U.S. 218, 225 (1994) (holding that "modify" as used in section 203 of the Communications Act did not allow for fundamental changes).

[24] Nat'l Broad. Co. v. United States, 319 U.S. 190, 216 (1943). Moreover, courts have recognized that regulations promulgated in the public interest must also be consistent with delegated authority. Motion Picture Ass'n of Am., Inc. v. F.C.C., 309 F.3d 796, 806 (D.C. Cir. 2002).

[25] *See Cellco*, 700 F.3d at 544.

Section 316 itself allows for protests by any licensees affected by a proposed modification and provides that the procedures for challenging the Commission's license applications and renewals decisions shall also govern section 316 protests.[26] In the case of license renewals, section 309 clearly states that the Commission may not consider whether the public interest would be served by granting the renewal or license to another entity rather than the licensee.[27] Thus, while section 316 allows for modification of licenses if it is in the public interest, the Commission may not alter licenses because it believes that another entity or use, such as 5G, would be better. Any permanent change to a license, such as restricting spectrum access from 3.7 GHz-4.2 GHz to any lesser spectrum, would either conflict with the terms of section 316 as interpreted by the D.C. Circuit or the Commission would have to prove, upon protest, that it had not considered licensing other entities instead of incumbent C-band operators.

As the earth stations are licensees, the Commission is obligated by precedent and the language of section 316 to avoid any plan that would fundamentally change the viability of FS operations. The FCC could incent operators to voluntarily relinquish spectrum rights that would radically change their operations (such as requiring them to relocate) but operators would need to consent to such changes and be compensated for such. Any changes without the consent of C-band incumbents would threaten to disrupt content distribution to hundreds of millions of Americans, thus failing to serve the public interest.

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[26] 47 U.S.C. § 316(a)(3).

[27] 47 U.S.C. § 309 ("[T]he Commission shall not consider whether the public interest, convenience, and necessity might be served by the grant of a license to a person other than the renewal applicant.")

C. The Commission must be involved in the reallocation process, which should recognize the rights of earth stations operators and compensate them for relocation, filter installations, and other costs of reallocation.

The Commission must be involved in any reallocation process. If the Commission elects to allow a private, market-based approach as proposed by the CBA in order to facilitate faster reallocation of the valuable C-band spectrum, the Commission should be highly involved in the process, which should be as transparent as possible. If an alternative approach is taken, such as an incentive auction, the Commission must ensure that FS and FSS operators are compensated sufficiently for vacating portions of the band. Additionally, the Commission must recognize that full-band full-arc protections become more important if FSS operations in the C-band are restricted.

While BYUB offers no opinion as to the method of reallocation chosen, whether a market-based or incentive auction, section 309 plainly states that any such distribution cannot enrich any single party or group unfairly.[28] The method of reallocation cannot overly compensate any private party and, as such, if the market-based approach is selected, the Commission should oversee the allocation of funds so that all incumbents are compensated fairly. As Comcast noted, allowing "private entities to fundamentally transform a band and transfer new rights to others with only minimal Commission oversight and without Congress's authorization would be extraordinary."[29]

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[28] 47 U.S.C. 309(j)(3)(C).

[29] Reply Comments of Comcast Corp., GN Docket No. 18-122, at 2 (filed Dec. 11, 2018). Additionally, a weakness of the CBA's proposal is that it does not provide for any remittance or sharing of proceeds with the Treasury. *See* Letter from Bill Tolpegin, Chief Executive Office, CBA, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed June 12, 2019).

Fair compensation under any approach would include the recognition of incumbent operations and rights in the spectrum as well as reimbursing incumbents for costs incurred due to the reallocation. The reallocation of the valuable C-band spectrum will require earth stations to install costly filters to control out-of-band emissions, the installation of fiber and relocation of operations if necessary, increased costs of coordination for transportable C-band uplinks, and other costs.[30]

BYUB joins with the with the Content Companies in saying that additional thought should be given to earth station protections.[31] Repacking all FSS and FS operations into the upper portion of the C-band requires that full-band full-arc protections be maintained. In fact, full-band full-arc protections become imperative in order to maintain consistent and reliable operations in the restricted band. Without these protections, the flexibility necessary for live sportscasts and other event programming would be unavailable and thus broadcasts of these events would be severely impacted. BYUB adjusts the band and arc of its receive-only earth stations often, sometimes multiple times a day, in order to serve its viewers with sports broadcasts and event programming. Any limitation of BYUB's ability to make these changes will negatively affect the families that BYUB serves.

The Commission should be involved in overseeing the allocation of funds from the reallocation of the C-band, whether through the market-based approach or an incentive option, so that incumbents are fairly compensated for the costs of the reallocation. Moreover, the

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[30] The amount of spectrum available and the number of satellites necessary to utilize that spectrum has an inverse relationship and thus more satellites will need to be launched in order to maintain operations. *See* Letter from Matthew S. DelNero, Covington & Burling LLP, Counsel to the Content Companies, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed June 10, 2019) (notifying of *ex parte* presentations).

[31] *Id.* at 3.

Commission must maintain full-band full-arc protections due to restricted operations in order to enable incumbents to continue providing Americans throughout the country with quality programming.

III. C-BAND DELIVERY IS VITAL TO BYUB'S OPERATIONS AND THERE ARE NO VIABLE ALTERNATIVES AT PRESENT.

The C-band backhaul infrastructure is vital to BYUB's operations, both because of its reliability and its economic efficiency. As noted by the American Cable Association, any reduction in satellite operations in the C-band would "have a hugely disruptive impact on the video programming industry" and this is especially true for BYUB's operations.[32] BYUB's programming schedule includes hundreds of hours of educational, entertainment, and sports content, including live sports. Often producing sports programs side-by-side with such entities as ESPN, the C-band—and especially transportable C-band uplinks—provides unparalleled levels of flexibility and dependability that cannot be equaled by any other means of video distribution, whether through fiber deployment or other satellite bands such as the Ka- or Ku-bands.

The limitations of Ka- and Ku-bands, such as their susceptibility to rain fade and other atmospheric interference, make them inadequate substitutes to the C-band as the decreased reliability would threaten contractual obligations between BYUB and cable/satellite partners as well as negatively impact the viewing experience of the millions of BYUtv viewers who depend on BYUB's programming.[33] Suggestions that broadcasters deploy redundant Ku-band earth

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[32] *See* Comments of American Cable Association, GN Docket No. 18-122, at 3 (filed Oct. 29, 2018) ("ACA Comments").

[33] *See, e.g.,* Comments of Comcast, GN Docket No. 18-122, at 5 (filed Oct. 29, 2018) ("Comcast Comments") ("Among the various satellite bands, the C-band is the most suitable for point-to-multipoint video distribution. C-

stations across geographies to mitigate the effects of atmospheric interference in the Ku-band would not be feasible. This would require broadcasters to install multiple earth stations and backhaul their signals via fiber to the network.[34] Changing systems to Ku-band, deploying multiple redundant earth stations across the mountainous Wasatch range, and laying fiber to the multiple deployments would adversely threaten BYUB's operations and its ability to serve its viewers.

Importantly, many commenters throughout the proceeding have recognized the importance of C-band FSS operations for delivery of video content like news, special events, and sportscasts.[35] PSSI observed that the C-band is still the preferred method for video delivery even when fiber may be available because of the C-band's superior capabilities.[36] The C-band is the most reliable and ubiquitous method for the distribution of video content and is irreplaceable as a distribution method for live sports and event programming. Although Brigham Young University's sports facilities are connected to BYUB's C-band uplinks via fiber, many college arenas throughout the country lack similar infrastructure and broadcasting capabilities so BYUB

band spectrum is immune to rain fade and other types of atmospheric signal loss that often materially impair the reliability of services in other bands, including the Ku-band. C-band satellites also use wide coverage beams, unlike in the Ka-band. Among other things, these characteristics allow cable operators to efficiently deploy new headends in rural and remote areas relatively quickly to ensure that consumers in those areas benefit from the same video and other services available in urban centers."); Comments of Luken Communications, GN Docket No. 18-122, at 3 (filed Oct. 29, 2018) (discussing the increased cost, decreased reliability, and negative impact on service of switching C-band systems to Ku-band systems); Coleman Bazelon, *Maximizing the Value of the C-Band: Comments on the FCC's NPRM to Transition C-Band Spectrum to Terrestrial Uses*, at 32-33 (filed Oct. 29, 2018) (attached as Appendix A to Intel, Intelsat SES Comments).

[34] Verizon Comments, at 13-14; *see* Comments of Satellite Industry Association, GN Docket No. 18-122, at 18 (filed Dec. 11, 2019).

[35] *See, e.g.*, Reply Comments of NCTA, GN Docket No. 18-122, at 2 (filed Dec. 11, 2018) (referencing comments by Comcast, AT&T, C-Span, Cumulus Media, and others); Comments of the Content Companies, GN Docket No. 18-122, at 4 (filed Oct. 29, 2018) ("Given the critical importance of the C-band to video content delivery and the lack of suitable alternatives, the Commission should abandon the false premise that existing FSS usage in the C-band could be shifted to alternative spectrum bands or terrestrial alternatives.")

[36] Letter from Stephen Diaz Gavin, Rimon Law, Counsel to PSSI Global, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 1 (filed Feb. 22, 2019) (notifying of *ex parte* presentations).

relies on transportable C-band uplink services in order to deliver sports games that take place off-campus.[37]

The C-band is critical in the live sports context because it provides a 99.99% reliable stream that is not inhibited by other traffic or prioritization as what would be experienced through internet distribution. Consequently, any limitation on C-band use by transportable C-band uplinks will severely impact BYUB's ability to deliver quality sports content and special event programming, as fiber is not an adequate alternative.

Transportable C-band uplinks and downlinks are a great equalizer in that they allow flexibility and they are also a cost-effective method for broadcasting and highlighting events at smaller venues that may not have the resources to support permanent video distribution operations. For example, a small university or college who only has the need to broadcast six to ten games a year from their arena may contract with a mobile C-band uplink in order to attain the same level of distribution capability and quality as any major arena in the country. BYUB contracts with transportable C-band providers at venues large and small across the country in order to provide sports fans with the best possible experience.

Ad hoc C-band uplinks provide the same quality of service and customer experience as what is provided by permanent uplinks and allow smaller venues or special events to achieve distribution capabilities that equal that of the largest broadcaster. Limiting or eliminating the availability of transportable C-band uplinks would not only make large venues incur the heavy

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[37] While on the surface the suggestion to use fiber instead of C-band delivery would seem feasible since many universities likely have robust fiber networks, this argument fails to recognize reality. As noted by many commenters, current fiber deployments are simply not widespread enough to be viable and the reliability is limited due to the susceptibility to lines being cut during construction. *See, e.g.*, Content Companies Comments at 3-4; Comcast Comments at 17-20. Moreover, while some institutions may have robust fiber networks, they may not have sufficient overhead to handle additional operations with the same reliability as C-band systems.

cost of installing fiber with sufficient overhead to manage distribution, but it would also inhibit smaller venues and news reporters from broadcasting signals from rural areas that lack fiber connections with adequate overhead. As noted by AT&T, any repacking of the C-band—including reallocating non-video satellite communications to the upper part of the band—should recognize the importance of mobile C-band satellite trucks to the distribution of sporting and political events.[38]

BYUB elects to utilize C-band services for distribution even where fiber is available because fiber has proven itself unreliable. BYUB has conducted internal and external tests on the viability of fiber for distribution of sports content instead of sole reliance on C-band. Unfortunately, the delays and inconsistent experience introduced into the viewing experience by fiber delivery caused substantial consumer dissatisfaction. Buffering of content increased viewing delays by up to fifteen seconds, which in live sports is the difference between an upset and a stunning defeat. The packetization of data over the internet and its many paths from source to target make it difficult for delivery of live content without visual artifacts and pixilation and sequence delay.[39] Thus, transportable C-band uplinks have remained BYUB's only option for sports content distribution.

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[38] AT&T Letter, at 14.

[39] For this reason, T-Mobile's argument that all earth stations could be replaced by connecting earth station locations to fiber are unconvincing. *See* Letter from Stephen B. Sharkey, Vice President, Governmental Affairs, T-Mobile, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 5 (filed June 21, 2019). Even if the cost to replace all earth stations were less than $1 billion—which itself is highly suspect as it does not consider rights-of-way fees and other costs of transitioning operations from C-band to fiber—utilizing the same fiber lines as all other internet traffic will certainly degrade the viewing experience of live sports unless some sort of prioritization is allowed. *See id.* Unfortunately, legislation at the state and federal level may impede any possibility of having the necessary prioritization. *See* CAL. CIV. CODE § 3100 *et seq.* (West 2019) (legislating net neutrality regulation in California); Save the Internet Act of 2019, H.R. 1, 116th Cong. (2019) (attempting to codify net neutrality regulations). Thus, C-band distribution remains the most efficient and effective method of video delivery, especially in the delivery of live sports content.

Some commenters have suggested that repacking the C-band and requiring earth stations to relocate will increase fiber deployment in rural areas thereby decreasing the Digital Divide and expanding fiber access.[40] This assumes that any fiber deployments made in the relocation will be overbuilt with sufficient overhead for both video and resident operations, instead of built in proportion to the needs of the relocating earth stations. Who would pay for the overbuilding? Would broadcasters be responsible for the cost of relocation and the additional cost of building fiber for rural residents' use as well? This argument ignores the reality that earth stations would simply pool their resources and relocate to unpopulated areas en masse, hoping to avoid future repacking and interference from mobile users. The suggestion that relocating earth stations will increase fiber access for rural residents fails to consider the costs of overbuilding and the realities of video operations.

Even more worrying is the call for licenses to be distributed on a PEA basis, with bidding starting for all 500 MHz, by T-Mobile.[41] Under T-Mobile's proposal, earth stations are required to clear PEA license areas if they lose at the forward auction stage.[42] In the west, PEAs cover large geographic areas; the relocation of earth stations from these PEAs will require extreme expenditures to build fiber links through mountainous terrain. And that assumes that adjacent PEAs have the necessary headroom in the band to support additional C-band operations after the auctions proposed by T-Mobile.

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[40] *See* Letter from Stephen B. Sharkey, Vice President, Governmental Affairs, T-Mobile, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 8 (filed Mar. 28, 2019) ("T-Mobile Letter").

[41] *Id.* at 2-3. While the CBA's proposal also utilizes PEAs, the allocation is limited to 200 MHz and thus there is no threat that sufficient headroom would be available in each PEA. Letter from Jennifer D. Hindin, Wiley Rein LLP, Counsel for CBA, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 1 (filed May 31, 2019)

[42] T-Mobile Letter, at 3-4.

For example, if 500 MHz is cleared for mobile terrestrial use in the PEA that covers the Provo and Salt Lake Metro areas, BYUB would need to build fiber into the mountains east or south of Provo. Because the adjacent PEAs cover large areas (the PEA directly east of Provo covers almost all of eastern Utah while the adjacent PEA to the south covers a large part of central Utah), if they also have some portion of C-band allocated for terrestrial use and not enough headroom available for BYUB's C-band needs, BYUB would be forced to continue moving farther and farther away from its center of operations at the BYU Provo campus. It is not out of the realm of possibility that BYUB would be required to build into Nevada, Idaho, or Wyoming (which are either adjacent or one PEA removed) to reach a PEA with sufficient C-band spectrum to continue operations.

The reliability and ubiquity of the C-band for video distribution is unparalleled and without it BYUB would not be able to provide its viewers with a viewer experience to rival any major network. Alternatives to C-band are inadequate and fail to provide the flexibility or reliability offered by C-band distribution systems, including the availability of transportable C-band uplinks. BYUB urges the Commission to adopt an approach to reallocation that recognizes the extreme importance of the C-band and the lack of realistic substitutes.

IV. CONCLUSION

The C-band is vitally important to BYUB's efforts to deliver family-friendly and educational content to viewers around the country. Any method of reallocation should fully address the costs to incumbent operators and provide adequate compensation for any changes needing to be made in order to accommodate terrestrial mobile applications within the C-band. As the Communications Act and Commission regulation recognize the rights of earth station

operators to authorized frequencies, the Commission may use auction revenues to encourage earth stations to relinquish frequency.

In addition, the chosen method for reallocation should recognize and account for the lack of viable substitutes for C-band distribution, especially in live sports and events programming scenarios. While fiber may be a suitable means of distribution in the future, it is not yet as ubiquitous as is necessary to substitute for C-band distribution. To the extent that the FCC decides that C-band spectrum must be repurposed, BYUB urges the Commission to maintain a sufficient amount of C-band spectrum for exclusive FSS operations and enact rules that adequately protect and compensate earth station operators moving forward.

Respectfully submitted,

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